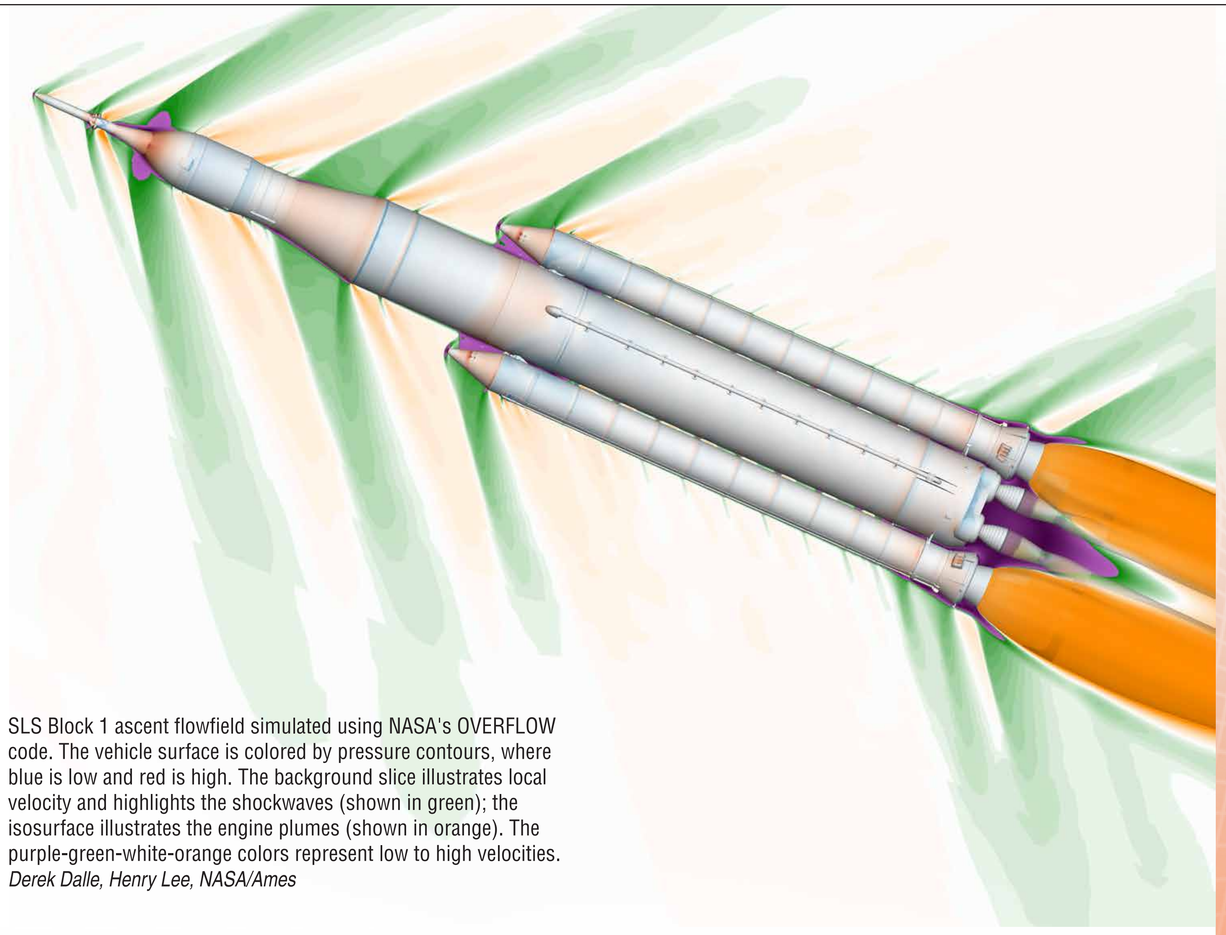
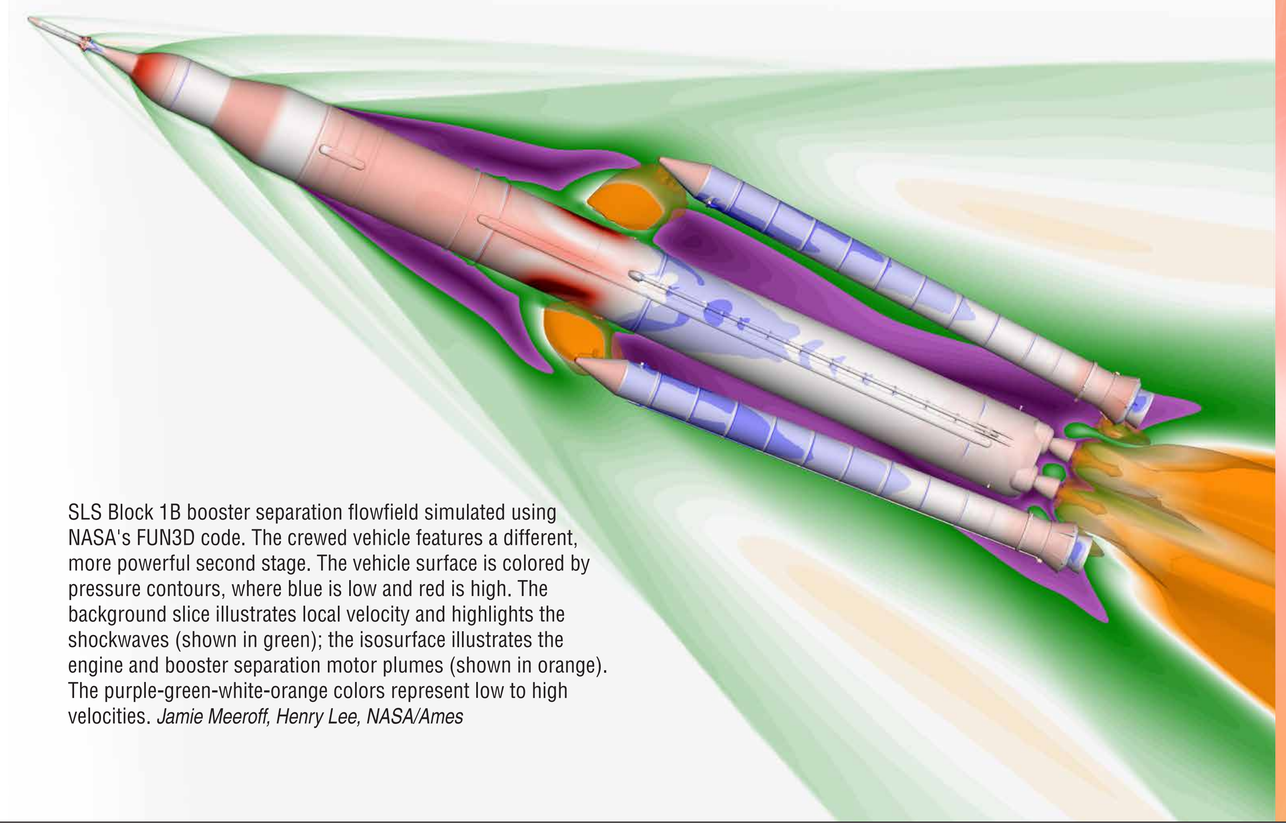


SLS Block 1 ascent flowfield simulated using NASA's OVERFLOW code. The vehicle surface is colored by pressure contours, where blue is low and red is high. The background slice illustrates local velocity and highlights the shockwaves (shown in green); the isosurface illustrates the engine plumes (shown in orange). The purple-green-white-orange colors represent low to high velocities. *Derek Dalle, Henry Lee, NASA/Ames*



SLS Block 1B booster separation flowfield simulated using NASA's FUN3D code. The crewed vehicle features a different, more powerful second stage. The vehicle surface is colored by pressure contours, where blue is low and red is high. The background slice illustrates local velocity and highlights the shockwaves (shown in green); the isosurface illustrates the engine and booster separation motor plumes (shown in orange). The purple-green-white-orange colors represent low to high velocities. *Jamie Meeroff, Henry Lee, NASA/Ames*

National Aeronautics and Space Administration

Building Aerodynamic Databases for the SLS Design Process

NASA's Space Launch System (SLS) will be the most powerful rocket ever built, enabling astronauts to travel into deep space. The SLS Computational Fluid Dynamics (CFD) team at NASA's Ames Research Center uses CFD simulations to build multiple aerodynamic databases to support the SLS design process. The team has performed more than 3,000 simulations of the SLS Block 1 vehicle in preparation for design certification review of the first uncrewed SLS flight (Exploration Mission-1). The Ames CFD team also supports the design of the Block 1B vehicle, which will support the first crewed flight (Exploration Mission-2) and future SLS cargo missions. These databases cover all aspects of the flight from ascent through stage separation. The Pleiades supercomputer enabled the team to run approximately 9,000 CFD simulations using 55 million core hours to build these databases.

Henry Lee, NASA Ames Research Center
Stuart Rogers, NASA Ames Research Center